

Notice of Allowability

Application No.

09/881,254

Examiner

Johannes P Mondt

Applicant(s)

HSHIEH ET AL.

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

NATHAN J. FLYNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

1. ☒ This communication is responsive to 12/01/2003.
2. ☒ The allowed claim(s) is/are 2-13,15,16 and 25-28.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Response to Amendment

Amendment filed 03/01/2004 forms the basis of this Official Action. In said Amendment Applicant substantially amended claims 2-4, 6, 10-13, 15-16 and 25-28 and claims 5 and 7-9 dependent thereon, and cancelled claims 1 and 14 (claims 17-24 had previously been cancelled), thereby having placed all outstanding claims 2-13, 15-16 and 25-28 in allowable form.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Attorney David Bonham on 3/8/04.

1. The following changes to the drawings have been approved by the examiner and agreed upon by applicant: Formal Drawings have to be submitted including type-set ordinates and abscissas of all graphs. In order to avoid abandonment of the application, applicant must make these above agreed upon drawing changes. End of Examiner's Amendment.

Allowable Subject Matter

2. ***Claims 2-13, 15-16 and 25-28*** are allowed.

The following is an examiner's statement of reasons for allowance (see also previous Office Action mailed 12/01/2003):

Darwish (6,084,264) specifically teaches the doping profile to be "relatively flat" (still, however, clearly non-flat; see Figure 8 for the net doping concentration profile in Darwish) in the central region of the P body region (cf. col. 2, l. 61 – col. 3, l. 3), while the embodiments shown in Figures 8-10 of the Specification clearly distinguish over those of Figure 7 of the Specification and over Darwish by comprising "a substantially peaked central region".

An update search has been conducted. However, no prior art has been found, i.e., a trench MOSFET transistor as defined by either claims 27 or 28 wherein the trench extends into the drain region and with the doping profile "*within said body region and within at least a portion of said source and drain regions*" being "*substantially symmetric*" in the sense defined by said claims 27 and 28.

Closely related art brought herewith to the attention of Applicant is Hashimoto (5,021,845), teaching a vertical IGFET with trench gate, teaching the claimed drain region, body region, source region, source metal, trench extending into the drain region, and gate region, said body region being separated from said source metal, and a doping profile in said body region that is non-uniform within the body region, teaching also a substantially peaked central region in the body's doping profile. However Hashimoto does not teach *the doping profile within the body region and within at least a portion of the source and drain regions to be substantially symmetric*, as claimed in the independent claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).